MARCOU, J.—Life, Letters and Works of Louis Agassiz. Vols. I & II. New York, 1896. From McMillian and Co., Pub.

MARSH, O. C.—Address before the National Academy of Sciences, April 19, 1895. From the Sec. of the Society.

Memoirs of the National Academy of Sciences, Vol. VII. Washington, 1895.

MERRILL, G. P.—Notes on Asbestos and Abestiform Minerals. Extr. Proceeds. U. S. Natl. Mus., Vol. XVIII, 1895. From the Museum.

Report of the Commissioner of Education for the year 1892–93. Vol. I. Washington, 1895.

Report of the National Academy of Sciences for 1895. Washington, 1896.

RIDGWAY, R.—Preliminary Description of Some New Birds from the Galapagos Archipelago. Extr. Proceeds. U. S. Natl. Mus., Vol. XVIII, 1895.

RUSSIAN GEOLOGICAL SURVEY.—Materialien zur Geologie Russlands, Bd. XVII. St. Petersburg, 1895. From the Soc. Imp. Mineralogique.

——Bibliothèque Geologique de la Russie 1894. St. Petersburg, 1895. Supplement to T. XIV, Bull. Comite Geol.

——Bulletins du Comite Geologique. St. Petersburg, XIII. Nos. 8, 9; XIV, Nos. 1–5, 1895. The Geol. Surv. of Russia.

——Memoirs de Comite Geologique. Vol. IX, No. 4, 1895; Vol. X, Nos. 3 and 4, 1895; Vol. XIV, Nos. 1 and 3, 1895. From the Geol. Surv. of Russia.

SMITH, E. F.—The Watermelon Wilt and other Diseases due to Fusarium.

——The Southern Tomato Blight. Extrs. Amer. Asso. Adv. Sci,, Vol. XLIV, 1895. From the author.

# General Notes.

## MINERALOGY AND CRYSTALLOGRAPHY.[1]

**Development of Faces on Crystals.**—Gaubert[2] makes a contribution to the subject of the growth of crystal faces by means of his experiments with the alums. An octahedron of chrome alum, on solution in its mother liquor, is rounded at its edges and angles. When the solution becomes again saturated, and the crystal begins to grow, faces of the forms (100), (110), (211) and (221) are developed, but disappear on continued growth, leaving finally only the octahedron (111). Experiments with crystals of chrome and potassium alum prove that the same faces are developed when the rounding is done mechanically instead of by solution. Potassium alum from pure water gives the form of octahedron and cube, but by rounding (211) and (221) may be caused to grow.

[1] Edited by Prof. A. C. Gill, Cornell University, Ithaca, N. Y.

[2] Bull. Soc. Fr. Min., XVIII, pp. 141–143, 1895.

Crystals of lead nitrate and of barium nitrate also develop transitory faces when rounded, returning to the original form of cubo-octahedron on continued growth. Miers has observed the formation of the face (221) by the extremely slow solution of the potassium alum crystals. Hence, it seems that these "transitory planes" may be formed either by corrosion or by growth of a rounded crystal.

**Albite from Lakous, Island of Crete.**—Viola,[3] by his paper on the new occurrence of albite at Lakous, adds another to the list of carefully investigated pure chemical substances. An analysis by Mattirolo, given at the end of the article, shows close agreement with the theoretical values for $Na\ Al\ Si_3O_8$ as may be seen from the following:

| | Found. | Theoretical. |
|---|---|---|
| $SiO_2$ | 68.35 | 68.70 |
| $Al_2O_3$ | 19.78 | 19.47 |
| $Na_2O$ | 11.71 | 11.83 |
| $K_2O$ | .16 | |
| Ign | .15 | |
| | 100.39 | 100.00 |

Measurements on twelve crystals, varying from 7½ to 20 mm. in diameter, agree very well in giving as crystallographic constants: $\alpha = 94° \ 14' \ 30''$, $\beta = 116° \ 31' \ 45''$, $\gamma = 88° \ 5' \ 1''$, and $\breve{a} : \bar{b} : \dot{c} = .635 : 1 : .557$. The extinction angle measured against the trace 001 in a section cut parallel to 010 is 21° 30′, in the section 001 it is 3° 30′. The optical angle is approximately + 80°. Inclusions of a member of the chlorite group are found in a number of the crystals, and some small scales of hematite in others.

**Forsterite from Monte Somma.**—The specimens seem to be of unusual chemical purity, hence the data given by Arzruni[4] on the the basis of investigations by himself, Jolles and Thaddéeff are doubtless near the true values for pure $Mg_2\ SiO_4$. The axial ratio is found to be a : b : c = .46663 : 1 : .58677. Cleavage parallel to 010, distinct. In addition to the previously observed method of twinning, the plane 031 is reported as a twinning plane.

[3] Tscherm. Mitth., XV, pp. 135–158, 1895.

[4] Zeitschr. f. Kryst., XXV, pp. 471–476.

The plane of the optical axes is the base, and the optical angle is 85° 38′ for lithium, 85° 45′ for sodium, and 85° 56′ for the thallium light.

The results of analysis are:

| | I. | II. |
|---|---|---|
| $SiO_2$ | 42.65 | 42.39 |
| FeO | 1.35 | 3.12 |
| MgO | 56.57 | 55.09 |
| CaO | .29 | |
| $Al_2O_3$ | | .23 |
| | 100.86 | 100.83 |
| Sp. G. | 3.223 | 3.245 |

The ratios $RO:SiO_2$ are 2.018 : 1 and 2.01 : 1 respectively, after deduction for probable impurities.

**Fayalite and the Chrysolite-Fayalite Group.**—Penfield and Forbes[5] found the fayalite from Rockport, Mass., suitable for optical and other investigations. The mineral was found in the shape of a lenticular shell in massive hornblende-biotite granite. The color is a dark resinous green, though the light transmitted by the thin edges is yellowish. The purified powder has a specific gravity of 4.318 (average of 3 determinations). The average of the two analyses is:

| | |
|---|---|
| $SiO_2$ | 30.08 |
| FeO | 68.12 |
| MnO | .72 |
| $H_2O$ | .80 |
| | 99.80 |

The cleavages are 001 and 010, and the reported occurrence of a cleavage 100 is considered a mistake.

The plane of the optical axes is the base, and the double refraction is negative. For sodium light. $\alpha = 1.8236$, $\beta = 1.8642$, $\gamma = 1.8736$, giving $\gamma - \alpha = .050$. The macro-axis is the acute bisectrix, $Vy = 25° 18'$.

A specimen of hortonolite from Monroe, N. Y., was also investigated. The table given below exhibits at a glance the effect of the iron on the optical characters of the chrysolite-fayalite group:

[5] Am. Jour. Sci., CLI, pp. 129–135, Feb., 1896.

| | % FeC | 2 V (over $\alpha$) | $\beta$ |
|---|---|---|---|
| Fayalite Rockport, | 68.1 | 49° 50′ | 1.864 |
| Hortonolite Monroe, | 47.3 | 69° 24′ | 1.791 |
| Chrysolite, Auvergne, | 13.0 | 89° 36′ | 1.692 |
| Chrysolite, Vesuvius, | 12.6 | 89° 42′ | |
| Chrysolite, Hawaii, | 10.3 | 91° 2′ | |
| Chrysolite, Egypt, | 9.2 | 91° 19′ | 1.678 |
| Chrysolite, N. M., | 8.6 | 91° 24′ | |
| Chrysolite, Unknown, | ? | 92° 14′ | 1.678 |
| Chrysolite, East Indies, | ? | 92° 45′ | 1.670 |
| Forsterite, Vesuvius, | 2 (?) | 93° 50′ | 1.657 |

At about 12% FeO, therefore, the optical character changes from positive to negative.

**Rhodophosphite and Tetragophosphite.**—The rare mineral locality at Horrsjöberg in Wermland, Sweden, is the source of these two new minerals recently described by Igelström.[6] The rhodophosphite occurs in large quantities in layers reaching a thickness of $2\frac{1}{2}$ feet, so that it can be mined profitably. At one locality it is found in the form of hexagonal prisms. From the partial analysis, it appears to be chiefly a calcium phosphate, with considerable quantities of ferrous iron and manganese, also chlorine, fluorine, and sulphuric acid. The formula proposed is $20\ (RO)_3\ P_2O_5 + 4\ (Ca\ Cl_2,\ CaF_2) + Ca\ SO_4$, where R = Ca, Mn, Fe, or Mg. The mineral is allied to svanbergite.

Tetragophosphite occurs in "four-sided" plates, or as a coating on the containing cyanite-damourite rock. The two analyses are:

| | | |
|---|---|---|
| $P_2O_5$ | 36.92 | 33.64 |
| $Al_2O_3$ | 40.00 | 41.81 |
| FeO, MnO | 9.51 | 9.51 |
| MgO, CaO | 7.50 | 6.74 |
| $H_2O$ | 5.96 | 8.30 |

These lead to the formula $(Fe, Mn, Mg, Ca)_3\ P_2O_8 + (Al_2O_3)_3\ P_2O_5 + 3H_2O$. It is somewhat lighter blue than lazulite, which it seems here to replace. The "Gusblått-phosphat" (light blue phosphate) from the Westanå Mts., Prov. Skåne, Sweden, analyzed by Blomstrand in 1868 seems to be undoubtedly the same mineral. He assigned the formula $(Ca, Mg)_3\ P_2O_8 + (Al_2O_3)_3\ P_2O_5 + 3H_2O$.

[6] Zeitschr. f. Kryst., XXV, pp. 433–436, 1895.

**Miscellaneous Notes.**—Von Zeynek[7] notes the occurrence of sulphur deposited in the canals carrying 1,000,000 gallons of water per day from the hot springs at Warasdin-Töplitz in Croatia.—Rohrer[8] gives results of two very careful analyses of hematite from Elba. The average of the two is as follows: $SiO_2$ .49, $Fe_2O_3$ 98.60, CaO .42, MgO .74, total 100.25.—In an article on the contact of minerals of the Adamello Group of mountains in South Tyrol, Salomon[9] gives a detailed discussion of the Wernerite from Breno, with much of the literature relating to that mineral.—Duparc and Stroesco[10] have recorded the results of their observations on the crystalline form and optical behavior of thymoquinone and eleven of its derivatives.—Gentil[11] describes the occurrence of large bundles of yellowish-white somewhat altered sillimanite needles in pegmatite from Algeria. Veins of albite and plates of muscovite are also mentioned. The same author[12] makes a note of thomsonite, stilbite and analcite from an altered basic volcanic rock occurring near Dellys in the province of Algiers.—De Gramont[13] is led by the observation of the electric spark between fragments of certain minerals which are good conductors of electricity, to a study of the spectra of the sparks thus produced. This method promises to be useful for the rapid determination of certain minerals, and for the detection of included substances which are present only in traces. The lines of the non-metallic, as well as of the metallic elements may be observed. De Gramont also describes the apparatus used by him, and gives the details concerning the spectra obtained from air from twenty-four of the elements, and from about a hundred minerals.—Termier[14] calls attention to the two forms of the dimorphous substance PbO. After discussing the optical and crystallographic properties of the orthorhombic modification, he shows that its crystals are grouped to imitate a higher symmetry. PbO is, therefore, a good example of a substance which not only shows pseudo-symmetry by the grouping of the separate crystals, but also appears in a second form in which the *molecular* grouping follows an allied higher symmetry.—Gonnard,[15] in an article on French

[7] Tscherm. Mitth., XV, p. 192, 1895.
[8] Tscherm. Mitth., XV, pp. 184–187, 1895.
[9] Tscherm. Mitth., XV, pp. 159–183, 1895.
[10] Bull. Soc. Fr. Min., XVIII, pp. 126–141, 1895.
[11] Bull. Soc. Fr. Min., XVIII, pp. 170–171, 1895.
[12] L. c., p. 374.
[13] Bull. Soc. Fr. Min., XVIII, pp. 173–373, 1895.
[14] Bull. Soc. Fr. Min., XVIII, pp. 376–380, 1895.
[15] Bull. Soc. Fr. Min., XVIII, pp. 382–390, 1895.

siderites, adds to the thirteen forms of that mineral previously known the three rhombohedra $(03\bar{3}2)$, $(30\bar{3}4)$, and $(10\bar{1}2)$.—Termier and Richard[16] conclude from their study of crystals of $Ca_4P_2O_9$ occurring in the slags of the iron works at Kladno, that they are pseudo-orthorhombic, composed of monoclinic lamellæ. Measurements of the apparently orthorhombic form agree well enough with those of Miers to show that both had to deal with the same substance. The specific gravity is 2.93–3.1, mean index of refraction, about 1.64. For red light, 2 V = 20° (?), and for blue light it is about 40°.—O. Nordenskiöld[17] finds edingtonite from Bôhlet, Sweden, to be orthorhombic hemihedral instead of tetragonal hemihedral, as previously supposed. Sp. G. = 2.776, plane of optical axes = 010, negative bisectrix parallel to the vertical axis, 2 V for lithium light = 52° 47′, for sodium = 52° 55, and for thallium 53° 10′. The indices of refraction for the above kinds of light are also determined. The mean index for sodium light is 1.5492, and the double refraction is .016. In conclusion, the similarity of form with that of mesotype is shown by the axial ratios:

Edingtonite a : b : c = .9872 : 1 : .6733
Mesotype a : b : 2c = .9785 : 1 : .7072

—Goldschmidt[18] figures and describes a projection goniometer by means of which the position of crystal faces is projected directly upon paper, thus doing away with the reading of angles and with trigonometrical computation. The instrument seems to be in many ways convenient, but does not give the highest degree of accuracy. A contact goniometer of similar action is also briefly mentioned.

## PETROGRAPHY.[1]

**Geology of Point Sal, California.**—The geology of Point Sal, the extreme northwestern corner of Santa Barbara County, California, has been carefully worked out by Fairbanks[2] with special reference to the igneous rocks found there. The sedimentary rocks constituting the point and the adjacent country are of miocene or later age. They

[16] Bull. Soc. Fr. Min., XVIII, pp. 291--295, 1895.
[17] Bull. Soc. Fr. Min., XVIII, pp. 395--398, 1895.
[18] Zeitschr. f. Kryst., XXV, pp. 538--560, 1895.
[1] Edited by Dr. W. S. Bayley, Colby University, Waterville, Me.
[2] Bull. Dep. Geol. Univ. of Cal., Vol. 2, p. 1.